

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re: Application of GORDON, Andrew W. et al.

Application No.: 10/734,050

Examiner: Krishnan S. Menon

Date filed: December 11, 2003

Art Unit: 1723

For: MOBILE DESALINATION PLANTS AND SYSTEMS, AND METHODS FOR
PRODUCING DESALINATED WATER

REPLY BRIEF UNDER 37 C.F.R. §41.41

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In reply to the examiner's answer mailed April 19, 2007 (hereinafter the "Answer"),
appellant respectfully submits this reply brief.

ARGUMENT

A. Claims 15-26, 28, and 30-35 meet the written description requirement of §112.

Claims 15-26, 28, and 30-35 stand rejected for failing to meet the written description requirement of 35 U.S.C. §112, first ¶ because the limitation “not at the first depth” was alleged to “not seem to have support in the original disclosure.”

1. The rejection of claims 18-20 and 32-34 is incorrect based on the examiner’s statements in the Answer. In the Answer, the examiner states that:

[t]he discharge port being located at a different depth in the body of seawater than the seawater intake may have adequate disclosure at the paragraphs cited by the appellant....

[a]pplicant also has not made any statement that discharge at ‘a site not at the first depth’ language is limited to discharge at or under the ocean surface to withdraw this rejection...

The rejection of claims 18-20 and 32-34 is thus incorrect as each of these claims indicates that the discharge port or discharge step is in the body of seawater at a depth differing from the first depth.¹

2. The rejection is incorrect because the “site not at a first depth” is adequately supported and the written description requirement does not require all possible species encompassed by a claim to be described in the application. In the Answer, the examiner argues:

...all those cited figures and paragraphs only disclose the discharge port as being located under the hull, and under or at the ocean surface, whereas, “a site not at the first depth” would encompass any and all sites (locations) other than the

¹ Claim 18 indicates that the discharge port is positioned at a site deeper than the first depth, claim 19 indicates that the discharge port is positioned at a site more shallow (*shallow* indicating under the sea surface) than the first depth, claim 20 indicates that the discharge port is positioned in or below a thermocline (which is under the sea surface), claim 32 indicates that the concentrate is discharged at a site deeper than the first depth, claim 33 indicates that the concentrate is discharged at a site more shallow than the first depth, and claim 34 indicates that the concentrate is discharged at a site in or below a thermocline.

location of the first depth, such as collecting in a tank, spraying in the air, distributing on land, etc., and such locations have no supporting disclosure.

First, appellant does not believe this assertion is accurate because, as noted in footnote 4 of the Appeal Brief, the specification describes a discharge port located on a vessel above the surface of the sea that would discharge concentrate through the air into the sea. Second, each of the rejected claims indicates that the discharge port is not just anywhere in the universe but a part of a system installed on a vessel. Third, the written description requirement does not mandate that an application describe every possible species encompassed by a claim as the examiner implies. The general rule with respect to written description is that “an applicant in a mechanical case is allowed claims, when the art permits, which cover more than the specific embodiment shown.”² Thus, written description support for a generic claim element can exist even if only one or a few species encompassed by the generic claim element are described. For example, in Utter v. Hiraga,³ the Federal Circuit affirmed the Board’s finding that an application that “describes in detail the geometry and components that make its internal pivot embodiment work” also sufficiently describes an interference count that is “silent as to the location of the pivot.” Accordingly because claims 15-26, 28, and 30-35 were improperly rejected under the written description requirement, the rejection should be reversed.

B. Claims 15, 28, and 30 are novel and non-obvious over Krylov (U.S. Patent No. 6,658,889).

Claims 15, 28, and 30 stand rejected as being anticipated by or obvious over Krylov. In the Appeal Brief, appellant argued that Krylov was entirely silent on concentrate discharge and

² In re Newton, 414 F.2d 1400, 1406 (C.C.P.A. 1969).

³ 845 F.2d at 998-99, 6 USPQ2d at 1714 (“A specification may, within the meaning of § 112 ¶1, contain a written description of a broadly claimed invention without describing all species that claim encompasses.”)

that the examiner had not met his burden of proof to establish inherency by showing that the claim limitations relating to concentrate discharge necessarily flow from the reference,⁴ and that the examiner had repeatedly not addressed the substance of appellant's argument as required by 37 CFR §1.104.

1. In the Answer, the examiner newly argues that Krylov's ice slush system operates "continuously" and therefore will cause the slush tank to overflow if it does not have a discharge port. This argument is incorrect for two reasons. First, even if the examiner's assertion were true, discharge could be by a means other than a discharge port (e.g., by a bucket attached to a rope). Second, by the term "continuous," Krylov is not referring to a process that is never stopped - even if no ice slush is required (e.g., after fishing is completed, the boat is at sea but not being used for fishing, the boat is en route to a distant fishing site, or simply enough ice slush has already been produced). Rather, as the description and common sense make clear, by "continuous," Krylov refers to a process that does not require discrete steps such as is encountered in conventional ice making: (i) filling a container with a liquid to be frozen, (ii) freezing the liquid in the container to yield ice, (iii) halting the freezing, (iv) removing the ice from the container, and (v) repeating this cycle.⁵ Thus the examiner's argument that a discharge port would necessarily have to be on Krylov's slush tank to avoid overflow is not correct.

2. In the Answer, the examiner further argues:

⁴ MPEP §2112 indicates "[i]n relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990)" and "[t]he fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993)."

⁵ See US Pat. Nos. 3,328,972 and 3,347,058 characterized by Krylov at col. 1, lns. 16-18 as being examples of "continuous liquid cooling to the freezing point."

Such a port will be at a different location than the intake, because first of all, it is physically impossible to have the intake and discharge at the same location. Secondly, the discharge would be on the tank, intake pump is at the reverse osmosis unit.

This argument does not directly apply to the rejected claims which recite intake at a first *depth* and discharge at a site not at the first *depth* – not a first *location* and a site not at the first *location*. Clearly, a system could have both an intake and discharge at the same depth (e.g., both located 10 meters below the surface of the sea) but not at the same location (e.g., the intake 75 meters north of the discharge). Thus, as neither (i) discharge through a discharge port or (ii) intake at a first depth and discharge at a site not at the first depth must by necessity be present in Krylov, this reference cannot be said to inherently teach or suggest these limitations. For the foregoing reasons, the rejection should be reversed.

C. Claims 28, 31, and 32 are non-obvious over Bosley (U.S. Patent No. 6,348,148).

Claims 28, 31, and 32 stand rejected as being obvious over Bosley on the basis that Bosley's use of ocean current to mix already discharged concentrate is equivalent to appellant's concentrate dilution before discharge.

1. In the Appeal Brief, appellant cited In re Ruff⁶ and argued that the examiner failed to show that the alleged equivalency was recognized in the prior art. In the Answer, the examiner reiterated his previous position stating:

...Bosley recognizes the problems associated with discharging the concentrate directly into the ocean - see column 1, lines 21-26 and column 4 lines 1-20. Bosley teaches that the concentrate must be mixed with seawater to sufficiently dilute it at the point of discharge, and finds an excellent solution by discharging

⁶ 256 F.2d 590, 118 USPQ 340 (CCPA 1958) ("In order to rely on equivalence as a rationale supporting an obviousness rejection, the equivalency must be recognized in the prior art, and cannot be based on applicant's disclosure or the mere fact that the components at issue are functional or mechanical equivalents.")

the concentrate at a location where there are high ocean currents. Therefore, Bosley makes discharge of “diluted concentrate” at a location ‘at a site not at the first depth’ very obvious.

This argument only indicates that Bosley teaches the problem and one solution. It does not show that *the prior art* (not the examiner) recognizes that Bosley’s direct dumping of undiluted concentrate is equivalent to appellant’s pre-dilution before discharge.

2. In the Answer, the examiner also dismissed appellant’s argument about the advantages of diluting brine with discharge stating: paragraphs [39] and [40] “...do not constitute any additional evidence....” The examiner, however, did not respond to appellant’s more detailed argument referring back to the July 27, 2006 amendment (see footnote 12) which stated:

Applicant’s method allows significantly more control over the concentrate dilution process and thereby significantly more control over mitigating damage to the environment. This advantage is particularly important on a sea-going vessel-based desalination system that might operate at different locations having different geographies, some of which might not allow placement of a discharge pipe at a mid-water location (e.g., at a shallow location near shore) or at a location which exposes the discharged undiluted concentrate to an ocean current of sufficient strength to promote sufficient mixing to mitigate environmental damage.

M.P.E.P. § 707.07(f) requires where a rejection is traversed by an applicant and thereafter is repeated by the examiner that the examiner should “take note of the applicant’s argument and answer the substance of it.” The examiner has repeatedly failed to address appellant’s detailed arguments concerning the advantages and additional control appellant’s method provides over the concentrate dilution process. Because the examiner has not questioned these advantages, they should be accepted at face value,⁷ and the rejection should be reversed.

⁷ Cf. *In re Herrmann*, 261 F.2d 598 (C.C.P.A. 1958).

D. Claims 15-23, 28, 30-35, and 37-41 are non-obvious over the combination of Lampe et al. (“PCS-Preussag Conversion Systems”, Elsevier, 1997), Permar (U.S. Patent No. 6,299,766) and/or Bosley.

Claims 15-23, 28, 30-35, and 37-41 stand rejected under 35 U.S.C. §103(a) as being unpatentable over the combination of Lampe, Permar, and/or Bosley. In the Appeal Brief, appellant argued that the bases of the rejection were not clear because the examiner did not directly compare the subject claim limitations with the cited references, but rather only described his very general interpretation of what the claimed subject matter is and how the references pertain to this generalization. Appellant also argued that the examiner rejected several claims without providing any reason whatsoever.

1. The Answer does not specifically provide reasons why claims 18, 30-35, or 37-41 were rejected. Despite the Answer’s statement that “[i]t will be shown that the combination of references will show all the limitations,” the examiner has not shown that the cited references teach all the limitations set forth in claims 18, 30-35, or 37-41. Because the examiner has provided no specific reasons to support the obviousness rejection of appellant’s claims, and therefore, has failed to establish a prima facie case of obviousness, the rejection of these claims should be reversed.

2. The proposed Lampe/Bosley combination fails to teach or suggest independent claim 15’s “mixing system” and independent claim 28’s “...discharging the diluted concentrate into the body of seawater at a site not at the first depth.” In the Answer, the examiner admits that the combination fails to teach a “space for mixing” (part of claim 15’s mixing system), but argues that the “space” is not a patentable limitation because “...the idea for mixing the concentrate with seawater to dilute it is already available ... from Bosley.” First, appellant notes that claim

15's "mixing system" includes not only a "space" but also two separate inlets and one outlet. Second, as described above, appellant disputes this contention because Bosley simply does not state or imply a system or method for diluting concentrate before it is discharged, much less a device for doing so.

3. The advantages of appellant's system and method are not taught by Bosley. The examiner argues that the advantages of appellant's system described in footnote 20 of the Appeal Brief are "...not surprisingly...also taught by Bosley, such as adverse effects to shoreline and ocean floor." Appellant respectfully believes this statement to be incorrect. Footnote 20 of the Appeal Brief recites:

See page 3 of appellant's Argument for Pre-Appeal Brief Conference and page 14 of appellant's July 27, 2006 Amendment ("Applicant's method allows significantly more control over the concentrate dilution process and thereby significantly more control over mitigating damage to the environment. This advantage is particularly important on a sea-going vessel-based desalination system that might operate at different locations having different geographies, some of which might not allow placement of a discharge pipe at a mid-water location (e.g., at a shallow location near shore) or at a location which exposes the discharged undiluted concentrate to an ocean current of sufficient strength to promote sufficient mixing to mitigate environmental damage.")

The pertinent portion of page 3 of appellant's Argument for Pre-Appeal Brief Conference states:

...the examiner appears to summarily dismiss applicant's argument that pre-discharge concentrate dilution is not equivalent to post-discharge concentrate dilution- even though he does not cite any prior art whatsoever that recognizes the alleged equivalency.

The pertinent portion of page 14 of appellant's July 27, 2006 Amendment states:

Applicant's method allows significantly more control over the concentrate dilution process and thereby significantly more control over mitigating damage to the environment. This advantage is particularly important on a sea-going vessel-based desalination system that might operate at different locations having different geographies, some of which might not allow placement of a discharge pipe at a mid-water location (e.g., at a shallow location near shore) or at a location which exposes the discharged undiluted concentrate to an ocean current of

sufficient strength to promote sufficient mixing to mitigate environmental damage.

Appellant does not see how these advantages are taught by Bosley.

4. Regarding claim 17, appellant had argued that neither Lampe nor Bosley teach or suggest a "...water intake member extendible from the hull into the body of seawater, wherein the water intake is on the distal end of the water intake member and the first depth is greater than ten meters" or any equivalent thereof, and that the examiner had failed to respond to this argument when it was presented in appellant's July 27, 2006 amendment and August 29, 2006 Arguments for the Pre-appeal Brief Conference Request. In the Answer, the examiner now argues that "the specification does not have support for 'intake member extendible from the hull', if the correct meaning of the word 'extendible' is used," and that appellant has not shown any patentable significance for a "length of pipe sticking out of the hull for the discharge port." In response, appellant notes that the examiner appears to be confusing the rejection based on §103 with the requirements of §112, first paragraph, and that no rejection of this claim under the latter has been made. In addition, the examiner appears to err in placing the burden on the appellant to prove the patentable significance of a claim limitation where the examiner has yet to make out a prima facie case of obviousness.⁸ In any case, as evidenced by the examiner only now suggesting a §112 issue exists, this term "extendible" and the subject limitation are readily understandable by one of skill in the art and amply supported by the specification at, e.g., paragraphs [0128] and [0129] ("...the member may extends to the depth or depths that optimize the mixing of the concentrate with the

⁸ See MPEP 2142 ("The examiner bears the initial burden of factually supporting any prima facie conclusion of obviousness. If the examiner does not produce a prima facie case, the applicant is under no obligation to submit evidence of nonobviousness.")

surrounding body of water.... the member 601 can be lowered and retracted to the vessel 101 by mechanical means....”).

5. Regarding claim 19, appellant had argued that neither Lampe nor Bosley teach or suggest a discharge port at site more shallow than the first depth, that in Bosley’s device discharge of concentrate at a depth shallower than the intake would appear to defeat the purpose of its mid-water discharge, and that the examiner failed to respond to this argument when it was presented in appellant’s July 27, 2006 amendment and August 29, 2006 arguments for the pre-appeal brief conference request. In the Answer, the examiner now argues that:

Position of the concentrate discharge whether below or above with respect to the feed port is not of any patentable merit, because they would be equivalent unless appellant can show otherwise; and there is no such showing.

Again, the examiner errs by placing the burden on the appellant to prove the patentable significance of a claim limitation where the examiner has yet to make out a prima facie case of obviousness. Moreover, the specification clearly points out the significance of positioning the concentrate discharge more shallow than the intake, e.g., interposing a thermocline between the intake and discharge to avoid intake of concentrate. Locating the discharge port more shallow than the intake might also prove important depending on the particular application of the claimed system (e.g., where the intake must be located below the plankton layer).

6. Regarding claims 20-23, appellant had argued that Lampe and Bosley fail to teach or suggest limitations contained therein. In the Answer, the examiner responded:

Claims 20-23 recite various locations of the intake and the discharge, which covers all the possible combinations with respect to the thermocline and level of planktons in the sea, which do not provide any patentable subject matter over the teaching of Lampe in view of Bosley, especially when Bosley teaches intakes in the depth of the ocean. There can be no criticality, when all possible combinations are claimed.

First, the examiner's remark does not address all the limitations of claims 22 (intake movable to different depths to avoid plankton intake) and 23 (system that can utilize *either* a sea chest or a water intake member). Second, the examiner does not cite any authority for "[t]here can be no criticality, when all possible combinations are claimed," and appellant is not entirely clear of what the examiner is arguing. In any case, not all combinations of intake and discharge position with respect to a thermocline are in claims 21 and 22; e.g., where the discharge port and intake are both (i) in or below a thermocline or (ii) both above a thermocline.

7. The Lampe and Permar combination fails to teach or suggest seawater intake at a first depth and concentrate discharge at a site other than the first depth. In response to appellant's argument that the combination of Lampe and Permar fails to teach or suggest a number of different limitations in the subject claims (including intake at a first depth and discharge at a site other than the first depth), the examiner argued:

This difference is not a patentable difference for the simple reason that it is not physically possible to locate the intake and the discharge at the same location, unless the intake and the discharge are through the same line or point.

From this statement, appellant understands the examiner is agreeing that the Lampe and Permar references fail to expressly teach or suggest an intake at a first depth and discharge at a site other than the first depth, but arguing that this limitation inherently exists because it is not physically possible for two different objects to be simultaneously located at the same *location*. Claims 15 and 28, however, relate to intake and discharge at a different *depth*. Clearly, it is possible to have intake and discharge at the same depth but at different locations. Accordingly, the subject limitation is not inherently taught in Lampe or Permar.

8. In the Answer, the examiner argued that "Bosley teaches that concentrate cannot be discharged, as is, into the ocean because of the adverse effects to the environment and recognizes

the need for diluting the concentrate at discharge” and that Permar teaches discharge of diluted concentrate. Appellant disagrees with the examiner’s statement about Bosley and notes discharge “as is” into the ocean is exactly what Bosley teaches. Bosley does not teach a component that actively mixes concentrate with seawater, but rather teaches a straight discharge pipe that dumps undiluted concentrate directly into the ocean where – provided appropriate currents are present – the concentrate becomes diluted somewhere down-stream of the discharge point.⁹

9. Permar does not teach discharge of diluted concentrate. In the Answer, the examiner cites to the embodiment shown in Fig.1 of Permar and concludes “[t]he diluted concentrate from plenum (44) is also discharged through the discharge line (54) through the adjustable control valve (56).” Appellant respectfully disagrees and maintains that Permar does not teach discharge of diluted concentrate. In the Answer, the examiner provides his interpretation of what Permar teaches about the operation of the embodiment of Fig. 1. Appellant has again carefully re-read Permar’s description of this embodiment (at col. 2, line 40 to col. 3, line 40) and respectfully disagrees with the examiner’s interpretation. Permar describes the plenum 44 in only 3 places as follows:

Col. 3, lns. 7-14. A length of conduit 42, also comprising part of the recirculation conduit means, is connected to the concentrate exit outlet 38 of reverse osmosis filter 24 and forms a continuous loop leading to the inlet 34 of reverse osmosis filter 18. In that loop is a rotary variable displacement pressure compensated recirculation pump 43, a plenum 44 and a rotary liquid metering device such as motor 46, the latter being illustrated as a variable displacement device.

Col. 3, lns. 32-34. Plenum 44 provides for the recirculation of the feed water and introduction thereof into the above-described enclosed recirculation system.

Col. 3, lns. 38-40. Connected to plenum 44 is a discharge pipe 54 having an adjustable flow control valve 56 operatively associated therewith to control feed water recirculation.

⁹ See Bosley col. 4, lns. 17-19 (“...the overall impact of increased salinity from the brine release could be infinitesimal as little as two or three kilometers down-current.”)

Although the latter section implies that something is discharged from the plenum 44, none of these sections specify *what* is discharged or, for that matter, to *where* it is discharged. Because the conduit 42 connects the concentrate exit outlet 38 of the reverse osmosis filter 24 to the plenum 44 (see col. 3, lns. 7-14) and because undiluted concentrate exits the reverse osmosis filter 24 at the “concentrate” exit outlet 38, a logical deduction is that the plenum 44 contains only undiluted concentrate (not concentrate diluted with fresh seawater as the examiner contends). Accordingly, if anything is discharged from the plenum 44 it would be undiluted concentrate. While Permar teaches that concentrate is recirculated through the series of RO filters and that it is diluted with fresh seawater before entering each RO filter, it is only at the point before it enters a RO filter that it is diluted concentrate because each RO filter re-concentrates the diluted concentrate such that the product that results at the “concentrate” exit outlet 38 and is transferred to the plenum 44 is always undiluted concentrate.

For the foregoing reasons, all of the outstanding rejections should be reversed. Although, appellant believes that no fee is due in connection with the filing of this paper, the Commissioner is hereby authorized to charge any underpayment or credit any overpayment of fees under 37 CFR 1.17 as required by this paper to Deposit Account 50-3110.

Respectfully submitted,

Date: June 18, 2007

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